

### **AMENDMENTS TO THE CLAIMS**

*The listing of claims will replace all prior versions and listings of claims in the application:*

#### **Listing of Claims:**

1. (Canceled)

2. (Currently Amended) A computer implemented method of identifying an object to be processed by one or more threads of execution comprising:

generating a design database that includes design objects, the design database corresponding to a diagrammatic representation of a desired behavior, wherein the design database include one or more design objects including one or more transport objects;

initiating a synthesis process in the design database, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more transport objects; and

for each thread:

associating an output of a transport object with an input of an object;

propagating information from an input of the transport object to an output of the transport object; and

propagating the information from the output of the transport object to the object.

3. (Currently Amended) A computer implemented method of identifying an object to be processed by one or more threads of execution as defined in claim 2, further comprising:

associating an output of a transport object with an input of an object;

propagating at least one of information concerning, dataset type, information rate or action latency, from an input of the transport object to an output of the transport object; and

propagating the information from the output of the transport object to the object.

4. (Currently Amended) A computer implemented method as defined in claim 2,  
further comprising of directing symbol substitution by comprising:

associating an output of a transport object with a function descriptor object;  
propagating parameter information from an input of the transport object to an output of the transport object; and  
substituting an equivalent function descriptor object in place of the function descriptor object based upon the propagated parameter information.

5. (Previously Presented) The computer implemented method of claim 4,  
wherein the propagated parameter information includes at least one of dataset type, information rate or action latency.

6. (Currently Amended) A computer implemented method of directing symbol substitution comprising:

generating a design database that includes design objects, the design database corresponding to a diagrammatic representation of a desired behavior, wherein the design database include one or more design objects including one or more transport objects;

initiating a synthesis process in the design database, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more transport objects; and

for each thread:

associating an output of a transport object with a function descriptor object;

propagating parameter information from an input of the transport object to an output of the transport object; and

substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;

wherein for any given set or pattern of input information atoms, the function descriptor object will produce the same set or pattern of output information atoms as the other function descriptor object.

7. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~  
~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein the function descriptor object is logically equivalent to the other function descriptor object.

8. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~  
~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein a data set of the function descriptor object is equal to a data set of the other function descriptor object.

9. (Previously Presented) The computer implemented method of claim 8,  
wherein the propagated parameter information includes dataset type information.

10. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~

~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein an information rate of the function descriptor object is less than or equal to an information rate of the other function descriptor object.

11. (Previously Presented) The computer implemented method of claim 10, wherein the propagated parameter information includes information rate information.

12. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~  
~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein an action latency of the function descriptor object is greater than or equal to action latency of the other function descriptor object.

13. (Previously Presented) The computer implemented method of claim 12,

wherein the propagated parameter information includes action latency information.

14. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~  
~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein the function descriptor object is logically equivalent to the other function descriptor object; and

wherein a data set of the function descriptor object is equal to a data set of the other function descriptor object.

15. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~

~~propagating parameter information from an input of the transport object to an output of the transport object; and~~

~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~

wherein the function descriptor object is logically equivalent to the other function descriptor object; and

wherein at least one of the following is true,

a data set of the function descriptor object is equal to a data set of the other function descriptor object, or

an information rate of the function descriptor object is less than or equal to an information

rate of the other function descriptor object, or

an action latency of the function descriptor object is greater than or equal to action latency of the other function descriptor object.

16. (Previously Presented) The computer implemented method of claim 15, wherein the propagated parameter information includes at least one of dataset type, information rate or action latency information.

17. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 6, comprising:

~~associating an output of a transport object with a function descriptor object;~~  
~~propagating parameter information from an input of the transport object to an output of the transport object; and~~  
~~substituting an other function descriptor object in place of the function descriptor object based upon the propagated parameter information;~~  
wherein the function descriptor object is logically equivalent to the other function descriptor object;  
wherein a data set of the function descriptor object is equal to a data set of the other function descriptor object,  
wherein an information rate of the function descriptor object is less than or equal to an information rate of the other function descriptor object, and  
wherein an action latency of the function descriptor object is greater than or equal to action latency of the other function descriptor object.

18. (Previously Presented) The computer implemented method of claim 17,  
wherein the propagated parameter information includes at least one of dataset type, information rate or action latency information.

19. (Currently Amended) A computer implemented method of directing symbol substitution comprising:

generating a design database that includes design objects, the design database corresponding to a diagrammatic representation of a desired behavior, wherein the design database include one or more design objects including one or more transport objects;

initiating a synthesis process in the design database, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more transport objects; and

for each thread:

associating an output of a transport object with a variant dataset type function descriptor object;

propagating explicit dataset type information from an input of the transport object to an output of the transport object; and

substituting at least one explicit dataset type equivalent function descriptor object in place of the variant dataset type function descriptor object based upon the propagated explicit dataset type information.

20. (Currently Amended) A computer implemented method of directing symbol substitution as defined in claim 19, comprising:

~~associating an output of a transport object with a variant dataset type function descriptor object;~~

~~propagating explicit dataset type information from an input of the transport object to an output of the transport object; and~~

~~substituting at least one explicit dataset type equivalent function descriptor object in place of the variant dataset type function descriptor object based upon the propagated explicit dataset type information;~~

wherein the variant dataset type function descriptor object is logically equivalent to the at least one explicit dataset type equivalent function descriptor object.

21. (Currently Amended) A computer implemented method of defining dataset type during synthesis of a design comprising:

generating a design database that includes design objects, the design database corresponding to a diagrammatic representation of a desired behavior, wherein the design database includes one or more design objects including one or more transport objects;

initiating a synthesis process in the design database, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more transport objects; and

for each thread:

associating an input of a variant transport with an upstream object in the design;

associating an output of the transport with a downstream object in the design;

propagating explicit dataset type information from the upstream object to the input of the transport;

propagating explicit dataset type information from the input of the transport to an output of the transport; and

propagating the explicit dataset type information from the output of the transport to the downstream object.

22. (Currently Amended) A computer implemented method of resolving a high level design into a detailed design comprising:

generating a design database that includes design objects, the design database corresponding to a diagrammatic representation of a desired behavior, wherein the design database include one or more design objects including one or more variant transport objects;

initiating a synthesis process in the design database, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more variant transport objects; and

for each thread:

associating respective output nodes of one or more variant transport objects with an equivalent function descriptor object;

associating respective information with respective input nodes of the one or more variant transport objects;

propagating the respective information from the respective input nodes of the one or more variant transport objects to respective output nodes of the one or more variant transport objects; and

substituting a less variant equivalent function descriptor object into the design in place of the variant equivalent function object based upon the respective propagated information.

23. (Previously Presented) The method of claim 22, wherein the propagated information includes dataset type information.

24. (Previously Presented) The method of claim 22, wherein the propagated information includes information rate information.

25. (Currently Amended) A computer implemented method of resolving a high level design into a detailed design comprising:

creating a graphical diagram in a computer system display,

which represents an algorithm

which includes a variant equivalent function descriptor graphical object

which includes one or more variant transport graphical objects, each including an input node and an output node, and

wherein the diagram represents the variant equivalent function descriptor graphical object coupled to one or more respective output nodes of one of the one or more variant transport graphical objects;

generating a design database that includes design objects based on the graphical diagram, wherein the design database include one or more design objects including one or more variant transport objects;

automatically creating, from the design database, a design in a computer readable medium,

which corresponds to the diagram,

which includes a variant equivalent function descriptor design object that corresponds to the variant equivalent function descriptor graphical object

which includes one or more variant transport design objects that correspond to the one or more variant transport graphical objects,

wherein each variant transport design object includes an input node and an output node, and

wherein the variant equivalent function descriptor design object is coupled to one or more respective output nodes of one of the one or more variant transport design objects; and

initiating a synthesis process in the design, the synthesis process including multiple concurrent threads of execution, wherein the multiple concurrent threads follow paths demarcated by the one or more variant transport objects by:

associating respective information with respective input nodes of the one or more variant transport design objects;

propagating the respective information from the respective input nodes of the one or more variant transport design objects to respective output nodes of the one or more variant transport design objects coupled to the variant equivalent function descriptor design object; and

substituting a less variant equivalent function descriptor design object into the design in place of the variant equivalent function design object based upon the propagated explicit information.

26. (previously Presented) The method of claim 25 further including:  
substituting a less variant equivalent function descriptor graphical object into the diagram in place of the variant equivalent function graphical object based upon the propagated explicit information.
27. (Previously Presented) The method of claim 25,  
wherein the propagated information includes at least one of dataset type, information rate or action latency.
28. (Previously Presented) The computer implemented method of claim 2,  
wherein associating an output of a transport object involves associating an output of a variant transport object;  
wherein the propagated information includes propagating explicit data set type information; and  
wherein propagating information from an input of the transport object to an output of the transport object includes substituting an explicit data set type transport object for the variant transport object.